

AMENDMENT UNDER 37 C.F.R. § 1.111
Application No.: 09/732,712
Atty Docket No.: Q57601

REMARKS

The Office Action of February 10, 2005 has been received and its contents carefully considered.

Claims 1 to 4, 7 to 21 and 23 are all the claims pending in the application, prior to the present amendment.

The Examiner has indicated that claims 1, 7 to 10, 13 to 16 and 23 have been allowed.

In Paragraph 2 of the Office Action, the Examiner objects to the drawings under 37 C.F.R. § 1.83(a).

The Examiner sets forth two reasons for the objection. Applicants discuss each reason below.

The Examiner's statement as set forth in the Office Action is not entirely clear, but applicants believe the Examiner is trying to say the following.

First, the Examiner is arguing that the drawings do not clearly show an apparatus in which liquefied ammonia is withdrawn from the measurement sample cylinder 9, and only show an apparatus in which a gaseous phase moiety of liquefied ammonia is withdrawn from the measurement sample cylinder 9.

The Examiner states that to differentiate between the liquefied ammonia and the gaseous phase moiety of the liquefied ammonia, a pipe, which is inserted in the liquefied ammonia in the tank (measurement sample cylinder 9) and used to withdraw the liquefied ammonia from the tank to the heater, should be shown in Fig. 1. The Examiner states that otherwise, Fig. 1 shows

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two identical tanks with pipes for withdrawing gaseous phase moiety of the liquefied ammonia, with one of the pipes being heated.

The second reason that the Examiner objects to the drawing relates to Fig. 4.

(i) The Examiner states that Fig. 4 demonstrates an IR spectrum sample without a clear indication of the absorption bands for water, which can be used for measuring its concentration.

(ii) The Examiner states that a number of the absorption bands in the spectrum gives rise to a question as to how pure the sample is. The Examiner states that it is not clear how all of the absorption signals can belong to water molecules.

(iii) In addition, the Examiner states that it is not clear as to the intensity of which line is used for calculating water concentration with respect to 1.7 ppm, because all the lines have different intensities.

In the Office Action, the Examiner states that any “structural detail that is essential for a proper understanding of the invention should be shown in the drawing”.

In response, applicants point out that the present claims are process claims, and that the MPEP at 601.01(f) states that it has been USPTO practice to treat an application that contains at least one process or method claim as an application for which a drawing is not necessary for an understanding of the invention under the first sentence of 35 U.S.C. § 113. Accordingly, applicants submit that the subject matter of the present claims can be understood without any reference to the drawing Figures and, therefore, it is not necessary for the drawings to show the

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invention. Thus, with respect to the Examiner's statement that any "structural detail that is essential for a proper understanding of the invention should be shown in the drawings", applicants submit that no structure details are necessary for an understanding of the invention.

In addition, under 37 C.F.R. § 1.83(a) that the Examiner cited, applicants point out that it states that conventional features disclosed in the description and claims, where there detailed illustration is not essential to a proper understanding of the invention, should be illustrated in the form of a graphical drawing symbol or a labeled representation (e.g. a labeled rectangular box). Applicants submit that the present drawings satisfy the requirements of 37 C.F.R. § 1.83(a).

With respect to the first reason for the Examiner's objections to the drawings and Fig. 1, applicants submit that the present Fig. 1 would be understood by one of ordinary skill in the art to be sufficient to illustrate a process in which liquefied ammonia is withdrawn from measurement sample cylinder 9 and introduced into the vaporization unit 3.

The measurement sample gas container 9 may have any structure as far as liquefied ammonia can be taken out from the container. Such structures are well known in the art. Applicants enclose herewith a sketch of new proposed Figure 5 which illustrates an example of such a well known structure. Fig. 5 illustrates the inside of the container 9. In Fig. 5, the dipping tube 50 of the container enables liquefied ammonia to be withdrawn from the interior of the container. Upon approval of Fig. 5, applicants will amend the specification as follows:

The measurement sample gas container 9 may have any structure as far as liquefied ammonia can be taken out from the container. Such structures are well known in the art. Figure 5 illustrates an example of such a well known structure. Fig. 5 illustrates the inside of the

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container 9. In Fig. 5, the dipping tube 50 of the container 9 enables liquefied ammonia to be withdrawn from the interior of the container.

Turning now to the second reason for the Examiner's objections to the drawings and Fig. 4 applicants submit that there is nothing wrong with Fig. 4.

With respect to item (i), and the Examiner's statement that Fig. 4 demonstrates an IR spectrum sample without a clear indication of the absorption bands for water which can be used for measuring its concentration, applicants point out that the specification, in the Brief Description of the Drawings, states at page 8 that Fig. 4 is a diagram showing infrared absorption spectra of water in ammonia measured by the method of the present invention.

The present specification states at page 10 that one or more of the named wave numbers can be used to measure infrared absorption intensity.

The present specification also states, at page 13, that Fig. 4 shows the results obtained when two kinds of liquefied ammonia different in water concentration (1.7 ppm or 0.3 ppm), each is vaporized using the vaporization unit 3 with the background of the reference gas and the ammonia gas is introduced into a cell and analyzed. The specification states at page 14 that from the results obtained, it can be seen that the wave numbers used in the measurement is preferably $3801 \pm 1 \text{ cm}^{-1}$, $3807 \pm 1 \text{ cm}^{-1}$, $3816 \pm 1 \text{ cm}^{-1}$, $3821 \pm 1 \text{ cm}^{-1}$, $3837 \pm 1 \text{ cm}^{-1}$, $3854 \pm 1 \text{ cm}^{-1}$.

Thus, the present specification clearly describes which ones of the wave numbers shown in Fig. 4 preferably are used in the measurement.

With respect to item (ii) and the Examiner's statement that a number of the absorption bands in the spectrum gives rise to a question as to how pure the sample is and the Examiner's

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statement that it is not clear how all of the absorption signals can belong to water molecules, applicants addressed this point in the Amendment filed on July 26, 2004 at page 13, where applicants stated that absorptions for water are not limited to the ν_1 and ν_3 absorptions disclosed in the Table at the website <http://www.lsbu.ac.uk/water/vibrat.html>. Applicants stated that when the water content in a gas is measured, the molecules freely rotate, and the transition occurs not only between the vibrational levels, but between rotational levels in each of the vibrational levels, which results in that water absorptions occur at many wave numbers.

In further support of applicants' position, applicants point out that absorption spectrum of water is shown in Aldrich Vapor Phase Library- HR(High Resolution; resolution of 4cm^{-1}) published by Aldrich Chemical, and existence of an absorption band can be confirmed in the spectrum. Applicants enclose herewith a copy of the Aldrich Vapor Phase Library-Hr (distributed by Thermo Nicolet Ltd.), showing an absorption spectra of water including various absorption bands of water at various wave numbers shown in Figure 4.

With respect to item (iii) and the Examiner's statement that it is not clear as to the intensity of which line is used for calculating water concentration with respect to 1.7 ppm, because all the lines have different intensities, applicants again refer to the description of Fig. 4 at page 14 where applicants state that the wave number used in the measurement is preferably one of the six wave numbers described at page 14. One who is seeking to make a measurement can select any wave number at which there is an absorption peak, and the specification describes preferred wave numbers for this purpose.

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Further, as discussed at page 10 of the present specification, a calibration curve prepared for determining the water concentration at a certain wavelength can be prepared in advance.

For example, first, infrared absorption spectra of water contained in ammonia liquids of known water concentrations are obtained. From the spectra, the absorbance at a certain wavelength, for example, the absorbance at 3801 cm^{-1} is calculated and a calibration curve is prepared. That is, the calibration curve at 3801 cm^{-1} is obtained by subtracting the absorbance at 3801 cm^{-1} (background) of the reference gas (gas phase of high-purity ammonia) from each of the absorbance values at 3801 cm^{-1} of the ammonia liquids of known water concentrations.

Next, according to the method recited in claim 1, infrared absorption spectra of water contained in ammonia as the measurement targets (vaporized sample and gaseous phase of liquefied ammonia as a reference) are obtained. From the absorbance (for example at 3801 cm^{-1}) obtained by the spectra, the water concentration is determined by using the calibration curve prepared above.

In view of the above, applicants request withdrawal of the objection to the drawings.

Applicants note that in Fig. 1, there is a space between connecting line 4 and measurement cylinder 9 at the point where these two members attach to each other. This space should not exist and it was the intention that connecting line 4 is attached to cylinder 9 in the same way as shown for connecting line 5 being attached to reference gas cylinder 10. Applicants enclose a replacement sheet of drawings to correct Figure 1 on this point, as well as an annotated sheet of drawings showing the correction in red.

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Further, in Fig. 1, connecting line 5 contains a vertical portion where it connects to connecting line 4. The drawing, however, shows a gap in this vertical portion. This gap was not intended. Applicants have drawn a half circle to connect these lines as a correction, and show this correction in red on the annotated sheet.

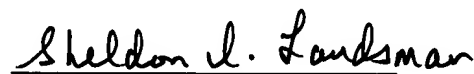
Claims 2 to 4 have been rejected under the first paragraph of 35 U.S.C. § 112 as failing to comply with the enablement requirement.

In response, applicants have canceled claims 2 to 4.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,


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WASHINGTON OFFICE

23373

CUSTOMER NUMBER

Date: June 10, 2005

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AMENDMENTS TO THE DRAWINGS

Please replace Figure 1 with the amended Figure 1 shown in the attached replacement sheet. The amendments to Figure 1 are explained in the Remarks.

Attachment: One (1) annotated sheet containing Fig. 1
One (1) replacement sheet containing Fig. 1

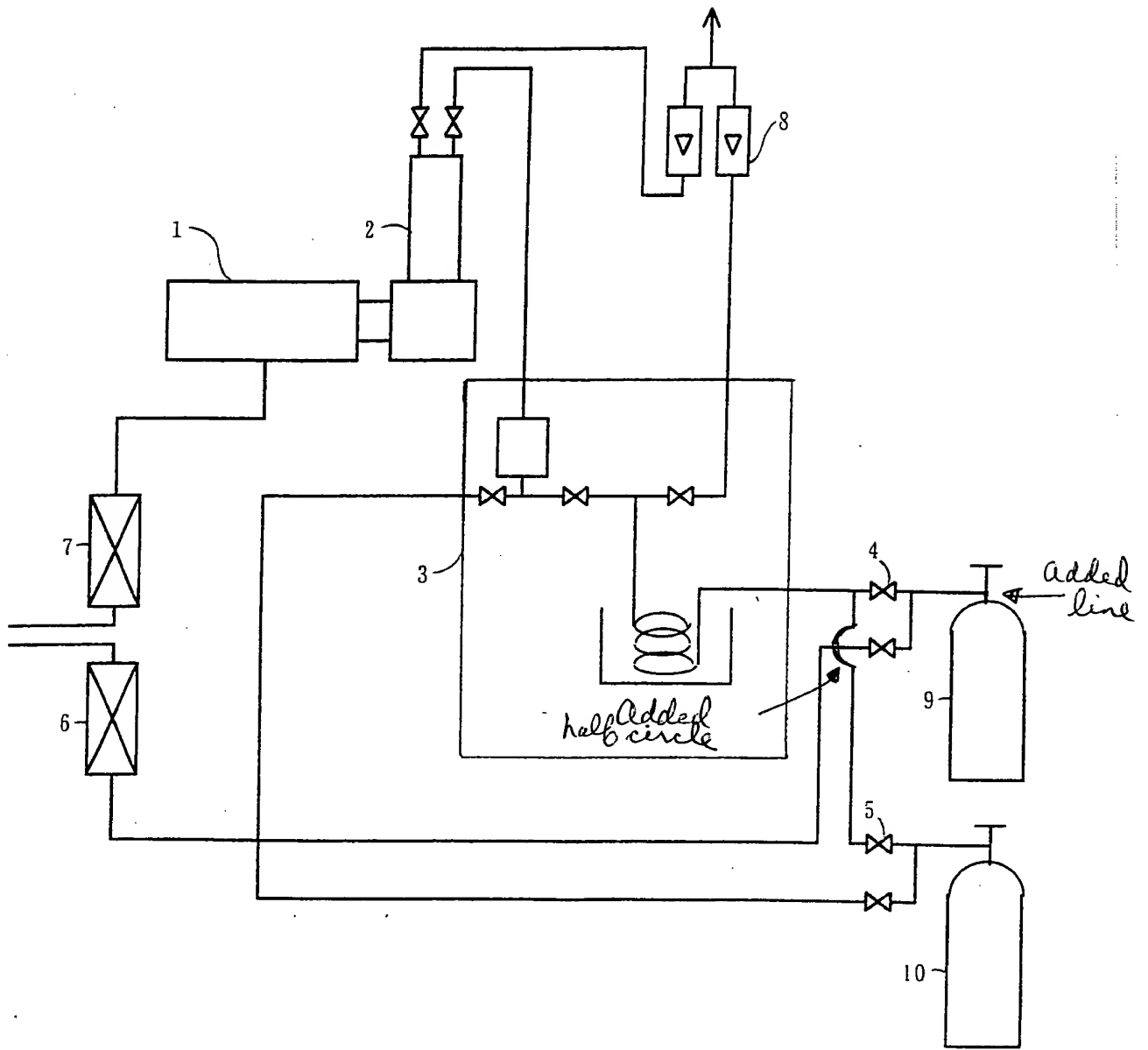


Fig. 1